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Case Report

Clinical Course of a Covid-19 Patient with Gastrointestinal Symptoms- A Case Report

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Abstract

Background: COVID-19 most commonly presents with respiratory symptoms. However, it can involve the gastrointestinal tract causing symptoms like diarrhea and the resultant shedding of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in feces. This is due to the virus adhering to angiotensin-converting enzyme 2 receptors largely present in the gastrointestinal tract. This case report recommends routine stool Real-Time Reverse Polymerase Chain Reaction (rRT-PCR) testing for patients presenting with gastrointestinal symptoms. **The Case:** A healthy 36-year-old male healthcare worker in New York who tested positive for SARS-CoV-2 infection through rRT-PCR of the nasopharyngeal swab. After 7 days of convalescence, he recovered from influenza like symptoms after which he predominantly developed diarrhea, nausea, vomiting and extreme fatigue. Cough was the only lower respiratory symptom during the 3rd week of the clinical course. Anosmia or ageusia preceding the onset of respiratory symptoms was also reported. Due to the outbreak of the pandemic and New York being the epicenter at the time, the patient was recommended to self-isolate with supportive management through antipyretics and electrolyte replacement. **Conclusion:** This case highlights a SARS-CoV-2 PCR positive patient with predominant gastrointestinal symptoms. The reports regarding virus shedding in feces suggest that SARS-CoV-2 could be transmitted via fecal-oral route and thus routine stool rRT-PCR testing can aid in transmission-based precautions. Furthermore, reports of viral ribonucleic acid present in the stool, suggests direct infectivity of the virus on the intestinal tract. Therefore, screening in patients with only gastrointestinal symptoms can potentially help to contain the virus spread.

Key Words: COVID-19; SARS-COV-2 pandemic; Gastrointestinal symptoms; ACE2 receptor; Fecal-oral transmission; Case report (Source: MeSH-NLM).

Introduction

A novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), with rapid spread worldwide, has now become a public health emergency.[1] A growing number of publications are shedding light on the frequency and nature of the gastrointestinal symptoms of coronavirus disease-2019 (COVID-19).[2] SARS-CoV-2 is thought to make its way into the gastrointestinal tract by adhering its spike proteins to angiotensin-converting enzyme 2 (ACE2) receptors, which are located in the lungs but also widely present in the gastrointestinal tract.[3]

A review article noted that diarrhea and vomiting was the most common symptom in children, diarrhea in adults whereas abdominal pain and gastrointestinal bleeding was mostly seen in severely ill patients, and it also showed that the incidence of gastrointestinal symptoms was higher in the later than in the early stages of the clinical course.[4]

Han et al, described a unique subgroup of COVID-19 patients with mild disease severity marked by the presence of digestive symptoms. This study demonstrated that the time between symptom onset and viral clearance was significantly longer in this subgroup and this longer disease course might reflect a higher viral burden in comparison to those with only respiratory symptoms.[5] Parasa et al, also found that these patients are more likely to test positive for COVID-19 viral Ribonucleic acid (RNA) in the stool, suggesting direct infectivity of the

A study by Xiao et al, highlighted the clinical significance of testing viral RNA in feces by real-time reverse transcriptase polymerase chain reaction (rRT-PCR).[6] According to the Centers for Disease Control and

Highlights:

- This case report highlights another possible option for the pathophysiology of the SARS-CoV-2 infection.
- It presented a case of predominant gastrointestinal symptoms in COVID-19 compared to lower respiratory symptoms.
- The case report depicts importance of rRT-PCR testing for fecal-oral transmission.
- Further research is needed to probe the role of fecal-oral transmission.

Prevention (CDC) guidance for the disposition of patients with SARS-CoV-2, the decision to discontinue transmission-based precautions for hospitalized patients with SARS-CoV-2 was dependent on the negative results of Real-Time Reverse Polymerase Chain Reaction (rRT-PCR) testing for SARS-CoV-2 from at least 2 sequential respiratory tract specimens collected ≥24 hours apart.[7] It was found that in more than 20% of patients, although the viral RNA in the respiratory tract were negative, it remained positive in feces indicating that the viral gastrointestinal infection and potential fecal-oral transmission [8] can last even after the virus has cleared from the respiratory tract.[2] It has been recommended that rRT-PCR testing for SARS-CoV-2 from feces should be performed routinely due to the high prevalence of positive stools in

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nal symptoms who tested positive for COVID-19. We obtained written consent, and the Human Infection with COVID-19 Person Under Investigation (PUI) and Case Report Form was filled by the patient.

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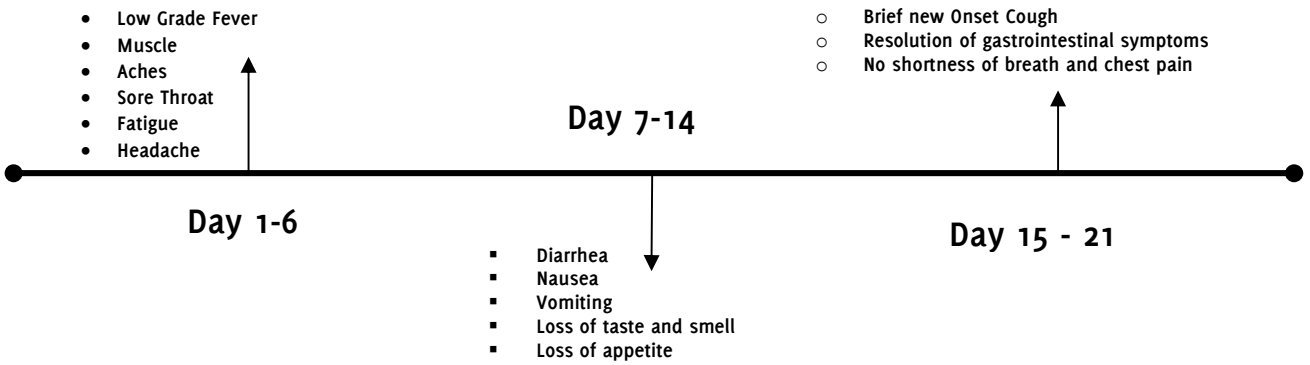
The Case

An otherwise healthy 36-year-old male, healthcare worker in New York, with no recent travel history and no history of diabetes mellitus, coronary artery disease, or hypertension presented to an urgent care with flu like symptoms (***Figure 1***).

The patient first noticed flu-like symptoms such as low-grade fever, chills, muscle aches, sore throat, weakness, and headache after possible healthcare contact with a COVID-19 case-patient. Vitals showed a temperature of 100.4 °F, blood pressure of 124/78 mmHg, heart rate of 95 beats per minute, and respiratory rate of 18 and pulse oxygen saturation of 97%. The National Early Warning Score (NEWS) was 1 (from 0 to 20, the score is related with clinical risk). The physical examination was normal otherwise. He was tested negative for Influenza Rapid Ag using the OSOM Ultra Flu Influenza A & B Test: Sekisui Diagnostics, LLC. A nasopharyngeal swab sample was performed on Day 1 of onset of symptoms to check for SARS-CoV-2 infection by using CDC 2019-nCoV Real-Time RT-PCR Diagnostic Panel protocol (CDC, Atlanta, Georgia, USA) that confirmed SARS-CoV-2 by positive result on polymerase chain reaction assay. No Radiological study (radiography or chest scan) was performed on the patient. He was placed under home isolation with daily monitoring for development of cough, dyspnea along with daily temperature and vital sign measurements. The patient was not prescribed antibiotics. Treatment during this time was largely supportive which included Acetaminophen 1000 mg every 8 hours as needed and a multivitamin a day. The patient started to notice improvement in his flu-like symptoms towards the end of the first week.

Figure 1. Timeline of the patient's symptoms after a possible healthcare contact with another COVID-19 patient.



On Day 7, the patient noticed sudden reappearance of fever, aches, chills, and weakness. He developed symptoms of diarrhea associated with nausea, vomiting, and complete loss of taste and smell. The patient mostly had watery stools that occurred 3-4 times a day for 1 week, no blood or mucus. He also had loss of appetite, inability to tolerate solid foods, significant weakness, and fatigue with no energy to perform daily activities. The patient did not undergo coproscopy and coproculture. There was no history of other infectious diseases such as HIV. There was no epidemiological link related to gastrointestinal symptoms such as food consumption, intoxication or fast food. The patient was on electrolyte replacement and plenty of oral fluids throughout the course of the illness due to gastrointestinal symptoms.

He had no cough, shortness of breath or chest pain. Vitals signs were: temperature 100.6 °F, blood pressure 95/60 mmHg, heart rate 104 beats per minute, respiratory rate 19, and pulse oxygen saturation of 99%. The NEWS was 4. At home supportive management with electrolyte replacement and plenty of oral fluids was the mainstay therapy.

In the 3rd week of convalescence at day 16, the patient developed a new onset cough but no shortness of breath, difficulty breathing or chest pain. He continued to have loss of taste and smell, but the diarrhea resolved.

At day 22, symptoms completely resolved but the patient continued to have some weakness and lethargy. The patient was not prescribed any antibiotics and did not require hospitalization, mechanical ventilation/intubation or ECMO (***Table 1***).

After the resolution of symptoms, the patient was followed-up by using CDC 2019-nCoV Real-Time RT-PCR Diagnostic Panel protocol (CDC, Atlanta, Georgia, USA) on Day 40 after the initial symptoms to assess clearance of viremia which was negative. He also underwent SARS-CoV-2 AB IgG test on day 138 that was positive indicating adaptive immune response to SARS-CoV-2.

Table 1. COVID-19 patient convalescence and findings

Duration	Presentation
Day 1-6	Low grade fever, chills, muscle aches, sore throat, weakness, and headache; started to feel better
Day 7-14	Worse again with sudden reappearance of fever, aches, chills, weakness, non-bloody watery diarrhea, nausea, vomiting, anosmia, ageusia, loss of appetite, fatigue.
Day 15-21	New onset cough, no shortness of breath or chest pain.
Day 22	Complete resolution of symptoms

Discussion

This case report describes a COVID-19 positive patient who initially presented with flu-like symptoms which was followed by diarrhea, nausea, vomiting, loss of appetite that lasted for most part of the illness with cough being the only respiratory symptom.

Receptor-mediated viral entry into a host cell is the first step of viral infection. SARS-CoV-2 enters cells via the angiotensin-converting enzyme 2 (ACE2) receptor, and this receptor is expressed in the glandular epithelial cells of the stomach, duodenum, rectum, and via the absorptive enterocytes of ileum and colon.[9] These receptors are rarely found in esophageal epithelium because the esophagus is lined by the squamous epithelium and ACE2 receptor mainly targets the glandular epithelium. Viral nucleocapsid protein staining in the gastric, duodenal, and rectal epithelium confirmed the presence of SAR-COV-2 in these locations. Although the viral RNA could be detected in the esophageal mucosa, failure to stain the viral nucleocapsid protein shows low infectivity in the esophagus. In addition, ACE2 expression is higher in the gastrointestinal tract than in the lungs.[10] Patients with digestive symptoms have more virus in the gut based on the stool RNA testing, and thus potentially greater damage to the gut mucosa.

The tissue tropism of the SARS-CoV-2 in the intestinal tract has a major role to play in the clinical presentation and viral transmission.[11] In a systematic review and pooled analysis of published and preprint literature of SARS-CoV-2 infection and gastrointestinal symptoms, it was found that approximately 10% to 12% of patients with COVID-19 experience gastrointestinal symptoms, such as diarrhea (7.4%) and nausea or vomiting (4.6%).[2] Similarly, with our case, diarrhea was mostly watery without any blood or mucus and abdominal pain was minimal in most cases.[2]

The longer disease course in patients with digestive symptoms might be because of higher viral burden in these patients in comparison to those with only respiratory symptoms.[12] As the intestinal wall is invaded by SARS-CoV-2, there may be increased permeability and diminished barrier function allowing easier invasion of pathogens across the intestinal surface area.[5] Recent evidence has shown that fecal nucleic acid is readily detected in the stool of patients with COVID-19 and rectal swabs are also positive in some patients.[4] Han et al, stated that given the high prevalence of positive stools and the correlation between diarrhea and stool positivity, routine rRT-PCR testing of feces should be recommended in COVID-19 patients, especially those presenting with digestive symptoms.[13]

Recommended management for these cases is based on supportive measurements,[5] as described here. The patient was not exposed to any other potential cause of gastrointestinal symptoms and the length of duration of his gastrointestinal symptoms without any comorbidities calls the attention towards the role of this potential way of infection.

More research is needed to identify the reliability of testing suspect patients based on oropharyngeal samples only vs. the addition of stool samples. Can a patient have a respiratory resolution (a negative test) but the virus can continue its pathogenesis in the gastrointestinal system? Can the patient restart respiratory symptoms through reinfection? These are a few questions that we are pending to answer.

Conclusion

Our case report highlights predominant gastrointestinal involvement in a COVID-19 patient due to intestinal tropism of SARS-CoV-2. Studies regarding virus shedding in feces suggest that SARS-CoV-2 could be transmitted via the fecal-oral route and thus routine stool rRT-PCR testing can aid in transmission-based precautions among patients with SARS-CoV-2 infection. Furthermore, COVID-19 viral RNA present in the stool, suggests direct infectivity of the virus on the intestinal tract. We would also recommend screening for SARS-CoV-2 infection in patients presenting with only gastrointestinal symptoms and possible symptomatic management.

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